BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Administrator Agency For International Development

Food Conservation Should Receive Greater Attention In AID Agricultural Assistance Policies And Programs

Developing countries lose billions of dollars of food annually throughout the storage, distribution, and marketing process. GAO assessed Agency for International Development policies for helping developing countr es reduce losses. It reviewed specific projects in the Philippines and Senegal and also considered reported results of projects in Panama.The Agency needs to

--promote host government policies that provide incentives for post-harvest food conservation,

--emphasize food conservation in its agricultural policies and prepare project guidance,

--develop a research strategy including more specific guidance and criteria for existing university cooperation agreements,

--promote a sound post-harvest storage program in Senegal, and

--address the apparent inefficiencies in a recently constructed $1.4 million food processing center in the Philippines.

COMPLETED
49

GAO/ID-82-29
JUNE 3, 1982

Request for copies of GAO reports should be sent to:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are $3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are $1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

INTERNATIONAL DIVISION

B-207383

The Honorable M. Peter McPherson
Administrator, Agency for International
Development

Dear Mr. McPherson:

This report discusses the need for the Agency for International Development to give food conservation greater attention in agricultural assistance policies and programs.

The report contains recommendations to you on pages 12, 17, 32, and 36. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Director, Office of Management and Budget, and to appropriate congressional committees.

Sincerely yours,

Frank C Conahan

Frank C. Conahan
Director

BEST DOCUMENT AVAILABLE

III

GENERAL ACCOUNTING OFFICE
REPORT TO THE ADMINISTRATOR,
AGENCY FOR INTERNATIONAL
DEVELOPMENT

FOOD CONSERVATION SHOULD RECEIVE GREATER ATTENTION IN AID AGRICULTURAL ASSISTANCE POLICIES AND PROGRAMS

D I G E S T

Inefficient agricultural systems cost developing countries billions of dollars annually in lost food. In 1976, GAO recommended that the Agency for International Development (AID) give more attention to the storage, distribution, and marketing systems in these countries. In December 1979, the Congress urged AID to provide proportionally more of its funds to reducing food losses.

GAO conducted this review to determine the actions AID has taken and should take to reduce food losses. GAO examined agricultural policies and guidelines, reviewed projects in Senegal and the Philippines, and considered reported results of one project in Panama.

GAO found that food conservation is a challenging area of development requiring strong commitment by both AID and host countries. This commitment requires that AID work closely with host countries in dealing with problems which limit performance of current projects. AID should also provide incentives to reduce future losses. AID should initiate stronger programs through its missions.

By adopting policies which foster consideration of post-harvest storage, handling, processing and marketing in conjunction with production projects, and by providing guidance to the overseas missions for developing specific projects, AID can more successfully realize the potential for increasing food availability through food conservation as well as production.

SENEGAL

Twenty-three government-controlled storage facilities were constructed at a cost of $11 million ($4.9 million AID). These facilities largely have been unused and their potential use in the future is uncertain because of government financial and management problems.

They were designed to enable the government to build a grain buffer stock, stimulate production, and save $2.5 million annually by reducing storage losses. The warehouses were expected to be filled with domestic grain by 1980. Despite the unused capacity and plans of the government to encourage greater private-sector development, other donors are promoting construction of additional public sector storage. Many officials believe that Senegal's storage needs are at the cooperative and small-farm level. (See p. 9.)

RECOMMENDATION

AID should help Senegal, in coordination with other donors, develop storage programs that make the best use of existing facilities and give increasing recognition to storage needs at the cooperative and small-farm level.

THE PHILIPPINES

The $12-million Integrated Agricultural Production and Marketing Project in the Philippines was designed to improve the productivity and income of small farmers. Success has been very limited in overcoming basic post-harvest problems which provided the framework for project approval. Inadequate farm storage and drying capacity forces small farmers to sell their rice during low price periods to avoid excessive losses. Higher prices are available for better quality rice, but the farmers cannot afford the necessary drying and threshing technology.

The largest project component was a $1.4 million food and feed grain processing center at Central Luzon State University. Questions remain unanswered regarding the potential for efficient use of the plant's capacity. (See p. 14.)

Other problems have been experienced in developing cost-effective equipment for small farmers. Extension programs and inputs for improved production and conservation technologies have rarely reached the farmers in remote areas. For example, AID and the International Rice Research Institute developed rice

threshers and dryers, but they were too expensive for individual small farmers. Strong cooperative efforts are required to economically justify their use. (See p. 15.)

RECOMMENDATION

In conjunction with the Philippine Government, AID should develop and implement a plan for efficient use of the food processing plant at Central Luzon State University.

RECIPIENT GOVERNMENT INSTITUTIONS AND PRICING POLICIES CONTRIBUTE TO LIMITED SUCCESS

Weaknesses in government-controlled marketing institutions and price policies contributed to minimal use of AID-financed facilities in Senegal and to delays and failure to achieve project objectives in Panama. Other projects in Senegal were also impaired by the limited capability of the national marketing agency which was dissolved in 1980 by the government. Government pricing policies provided inadequate incentives in Panama, the Philippines, and Senegal for greater food conservation efforts. Promoting private-sector development has been suggested as one alternative to public sector dominated marketing systems, but practical ways to do so in the economic and political environments of developing countries have not been defined. (See pp. 20 through 24.)

CONCLUSION

GAO believes AID and other U.S. agencies need to encourage developing country policies and institutions which minimize deterrents to producing and conserving food and provide adequate incentives for adopting post-harvest loss control technologies.

FOOD CONSERVATION EFFORTS CAN BE ENHANCED THROUGH POLICY EMPHASIS AND PROJECT GUIDANCE

AID's agricultural assistance policy, with its traditional emphasis on production, does not encourage greater attention to post-harvest problems; it views food production and food conservation as competing rather than complementing functions; and it essentially stresses storage programs as the basic technology for

reducing losses. Some officials of AID and other organizations advocate an approach that recognizes all elements in the food chain from producer to consumer. (See p. 28.)

Missions have not been provided policy guidance on designing and carrying out food-loss reduction projects. Such guidance should provide a better basis for overall mission planning and assist in designing projects with goals subject to practical measurement. (See p. 30.)

RECOMMENDATIONS

AID should change its agricultural policy to recognize food production and food conservation as complementing rather than competing functions and articulate production policy in such a way as not to inhibit consideration of food conservation measures; require the missions to address postharvest problems in their country development strategies or if more appropriate, in their agricultural sector assessments; and provide guidance to its missions in designing loss-reduction projects, including setting goals that are more subject to verification.

BETTER MANAGEMENT OF RESEARCH ACTIVITIES IS NEEDED

AID has not prepared a strategy or plan for directing its post-harvest research activities or for setting funding limits, and it does not know how much it spends for such research. This information appears to be essential to manage long-term research activities. (See pp. 34 through 36.)

Research under university cooperative agreements has been cited as one of the major efforts in support of a U.N. goal of reducing post-harvest food losses. However, the agreements do not provide adequate criteria for selecting research projects and for distinguishing between research and technical assistance, nor require prior AID approval of the research to be conducted. Questions have been raised whether some research is consistent with development assistance objectives.

RECOMMENDATIONS

AID should develop a post-harvest research strategy which includes priorities, scope of activities, and an appropriate emphasis on identification and use or adaptation of existing technologies; and amend the university cooperative agreements to clearly establish what research is to be conducted and the amount of money to be spent.

AGENCY COMMENTS

GAO obtained oral comments on this report from AID officials. There was general agreement that the reduction of post-harvest food losses can provide increased availability of food for the growing numbers of malnourished in the Third World. It was believed that GAO's report will help focus the awareness of AID policy makers and development specialists on the importance of food conservation. It was stated that GAO had correctly identified many important post-harvest issues still requiring resolution in terms of policy, guidance to the missions, research and development strategy. Resolution of these issues can enhance AID's ability to more directly improve the well-being of the world's poor majority.

AID officials indicated that the report gave too much attention to research relative to other food conservation requirements. They suggested that program emphasis should be on adapting existing technologies rather than greatly increasing research efforts. GAO's report essentially discusses management of post-harvest research activities, including the need to better identify such activities. AID's suggestion on adapting research technologies is in harmony with expressions of other donors and GAO's recommendation.

AID officials generally agreed with GAO's recommendations. Their more detailed comments are incorporated in the report.

Tear Sheet

Contents

CHAPTER		Page
DIGEST		i
1	INTRODUCTION	1
	Overview of AID assistance	2
	Objectives, scope, and methodology	4
2	FOOD CONSERVATION PROJECTS NEED BETTER MANAGEMENT	8
	Substantial progress has yet to be demonstrated in reducing food losses	8
	Senegal	9
	Recommendations	12
	The Philippines	13
	Conclusion and Recommendation	17
	Panama	18
	Agency comments and our evaluation	19
3	RECIPIENT GOVERNMENT INSTITUTIONS AND PRICING POLICIES CONTRIBUTE TO LIMITED PROJECT SUCCESS	20
	Limited capability of government-controlled marketing agencies	20
	Pricing policies provide inadequate incentives	23
	Conclusion	24
4	FOOD CONSERVATION EFFORTS CAN BE ENHANCED THROUGH AID POLICY AND MANAGEMENT CHANGES	27
	Policies should emphasize conservation to complement food production	27
	The cost issue	28
	Guidance should be provided the missions on planning, designing, and evaluating food-loss reduction projects	30
	Realistic project goals needed	31
	Recommendations	32
	Agency comments and our evaluation	33
5	NEED FOR A COHERENT RESEARCH POLICY AND IMPROVED MANAGEMENT OF RESEARCH ACTIVITIES	34
	Recommendations	36
	Agency comments and our evaluation	37

APPENDIX

I RECENT GAO REPORTS COMMENTING ON HOST-GOVERNMENT PROJECT SUPPORT 38

ABBREVIATIONS

ADB	Asian Development Bank
AID	Agency for International Development
FAO	U.N. Food and Agriculture Organization
GAO	U. S. General Accounting Office
IDB	Inter-American Development Bank

BEST DOCUMENT AVAILABLE

TRADITIONAL MILLET STORAGE STRUCTURE IN SENEGAL. OCTOBER 1981 (PHOTO BY GAO STAFF)

STORING UNTHRESHED MILLET IN A SMALL VILLAGE. OCTOBER 1981. (PHOTO BY GAO STAFF)

CHAPTER 1

INTRODUCTION

•Food losses after harvest have been estimated to exceed all bilateral food aid to developing countries each year.
--Agency for International Development.

•Post-harvest food losses of 30 percent require off-setting production increases of 50 percent.
--International Development Research Center.

•When the consequences of food losses are measured in terms of human suffering and economic cost, they represent an international challenge that merits priority attention.
--National Academy of Sciences.

Food availability remains a principal concern of most people in developing countries. Traditionally, development emphasis had been placed on the opportunities for increasing food production, however, many authorities now believe it is advisable to devote more attention to other opportunities for improving the food situation--one of the most important being the need to better conserve food--specifically, to reduce substantially the losses of food after harvest. Millions of tons of food valued at billions of dollars are estimated to be lost each year in developing countries.

Post-harvest food losses which may occur between harvest, consumption, or other use include loss of weight, nutritional value, economic value, quality, or acceptability. These losses may occur in many ways, such as chemical change, mold, and infestation by insects and rodents.

Estimates of food losses are affected by the inherent variability of losses, the nature of specific commodities and conditions, the many cultural and economic factors which may interrupt the flow of food from producers to consumers, and the lack of proven methodologies for making estimates. Various organizations have made statements about food losses. For example, the National Academy of Sciences estimates that cereal grains and legumes (10 percent) and perishables and fish (20 percent) are lost. The Food and Agriculture Organization of the United Nations (FAO) estimates that corn (14-20 percent in Latin America; 9-29 percent in Africa) and durable commodities (6-14 percent in the Near East) also suffer losses. According to the Presidential Mission on Agricultural Development in Central America and the Caribbean, 40 percent of all food in the Caribbean Basin is lost.

Food losses, combined with population growth from about 4 billion now to an estimated 6 billion or more by the year 2000, show a vital need for measures to reduce the loss of food during and after harvest along with measures to increase food production. Loss of food reduces already inadequate supplies. Further, in the absence of effective conservation measures, losses will likely increase progressively as production increases to meet the food needs of the increasing population.

We reported in 1976 1/ that neither the Agency for International Development (AID) nor other foreign assistance donors had adequately emphasized reducing food loss after harvest as a complement to food production programs. In a 1978 follow-up report, the AID Inspector General concluded that AID's worldwide efforts to reduce post-harvest losses needed better focus if our recommendations were to be implemented properly.

The Senate Committee on Foreign Relations has expressed concern for a number of years about the low priority AID has given to reducing post-harvest food losses. This concern culminated in December 1979 with the enactment of Section 317 of the International Security and Development Cooperation Act of 1980 which expresses the sense of the Congress that (1) the United States reaffirm its support of the 1975 U.N. Declaration to reduce post-harvest food losses in developing countries by 50 percent and (2) AID provide a substantially greater proportion of its funds to reducing post-harvest food losses.

OVERVIEW OF AID ASSISTANCE

In congressional testimony, AID acknowledged that its efforts to reduce post-harvest food losses have not kept pace with the apparent severity of the problem and this is apparent from available information on the extent of its food conservation efforts. AID has neither a specific food-loss reduction policy nor specific criteria for program support.

Funds devoted to post-harvest loss reduction programs cannot be readily ascertained because such activities are not specifically identified and categorized, especially for components of larger agricultural projects which the missions carry out. AID has estimated that $14.7 million (2.1 percent) of its $700 million for agriculture, nutrition, and rural development programs for 1982 are allocated for marketing and storage programs. Other funds have been allocated from the Economic Support Fund to solving post-harvest problems.

1/"Hungry Nations Need To Reduce Food Losses Caused By Storage, Spillage, and Spoilage," (ID-76-65, Nov. 1, 1976.)

Mission storage and marketing programs have a variety of objectives, such as improving government grain storage programs, building farm storage for small farmers, helping small farmers move beyond subsistence farming, and improving perishables marketing. Several Bureau for Science and Technology technical assistance and research programs support these mission efforts.

Kansas State University and AID have worked together since 1967 to address grain post-harvest problems. Under the current agreement, Improvement of Post-Harvest Grain Systems which was initiated in 1980, the university conducts basic and developmental research to reduce post-harvest food losses; provides information, consultants, and training to participating countries; and cooperates with the University of Costa Rica on research and a student and information exchange program. The current 5-year cooperative agreement with the university outlines a total $5.6 million in AID grant funding between September 1980 and September 1985, although AID officials believe that fiscal constraints may reduce the total funding available.

The University of Idaho established the Post-Harvest Institute for Perishables under a 1980 project on Technical Assistance in Storage, Marketing, and Processing of Fruits and Vegetables. The institute plans to supply technical assistance, training, and information to reduce and prevent losses of roots, fruits, tubers, vegetables, spices, and nuts. Beginning in fiscal year 1980, AID will provide an estimated $2.2 million to the University of Idaho over a 5-year period for the perishables project. AID officials note that revised budget estimates indicate a reduction in the total 5-year funding.

In 1976, AID, the Canadian International Development Research Center, and the Canadian International Development Agency, initiated the Southeast Asia Cooperative Post-Harvest Research and Development Program; the Australian Development Assistance Agency recently joined the program. The objectives are to help increase the availability of food grains (particularly rice) in the Philippines, Indonesia, Malaysia, Thailand, and Singapore, through improved post-harvest technology. The program was established to be a catalyst in the region by supporting and encouraging cooperation and coordination among development agencies. As part of its cooperative agreement with AID, Kansas State University provides administrative support for the program and funds the salary and support for one member of the program team.

Earlier work that AID supported--and was carried out by the League for International Food Education and the American Association of Cereal Chemists--resulted in a method to assess post-harvest grain losses. This method has yet to be proven and accepted, however. A new project--Farm Level Post-Harvest Grain Losses--is being designed to apply the method in three developing

countries and to assist these countries in setting national priorities and in designing programs to decrease grain losses throughout the grain marketing system.

An AID/National Academy of Sciences contract in October 1976 was drawn up to determine world food losses and to recommend appropriate methods of intervention. The Academy recommended in May 1978, that AID substantially strengthen its activities to reduce post-harvest food losses and outlined a broad series of programs for consideration. The AID/Academy study led to the establishment of the University of Idaho program, as well as the establishment of two post-harvest document sharing operations.

In addition to the AID programs, the United States participates in multilateral organizations that have activities which are related to reducing post-harvest food losses. The primary multilateral organizations include FAO, the World Bank, the Inter-American Development Bank (IDB), and the Asian Development Bank (ADB). FAO is the only multilateral organization with a specific post-harvest food loss program. In January 1978, FAO began its program. Its projects are required to meet very specific criteria in terms of host-government support, application of small-scale and replicable technologies, and to demonstrate impact. As of September 1981, approximately 60 projects in 55 countries had been approved for funding, totaling about $13 million in obligations. The multilateral banks do not have specific programs relating to reduction of food losses, but numerous projects include loss reduction objectives, such as improved processing, marketing, and storage.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives were to determine what actions the United States has taken or should take to reduce food losses as part of its agricultural programs. We examined the adequacy of AID agricultural assistance policies as they relate to post-harvest loss problems and the extent to which a well-focused program has been developed to consider food conservation as a complement to food production. We selected certain projects in developing countries to review how well they were achieving their stated post-harvest objectives and to determine what lessons could be applied to future projects and policy formulation. In performing our review, we adhered to the Comptroller General "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

We reviewed records and reports and interviewed officials at AID; at the Departments of State and Agriculture; and at the Department of the Treasury. We also held discussions with officials of FAO and the U.S. Mission to FAO in Rome; ADB in Manila; IDB and the World Bank in Washington, D.C.; the International Rice Research Institute in Los Banos, the Philippines; the Tropical Products Institute in London, England; and the Governments of the

Philippines and Senegal. We also held discussions with Thailand's representative to the Southeast Asia Cooperative Post-Harvest Research and Development Program. Our discussions focused on perceptions of the post-harvest food losses; policies, strategies, and assistance trends; problems in carrying out assistance projects and potential solutions; merits of giving food conservation programs a higher priority for agricultural assistance; and possible courses of action for future assistance.

In Senegal, we reviewed the host-government controlled grain storage project (which AID partially financed at a cost of $4.9 million), and the small farmer storage component of the $4.7 million Cereals Production I Project. The 1978 AID Inspector General report noted that in Senegal off-farm grain post-harvest loss rates were about 25 to 35 percent, largely due to the lack of sufficient storage and the improper treatment of stored food. The report also noted that these grain storage projects represented AID efforts to address the problem. The AID long-range goal is to help the country attain food self-sufficiency, defined as achieving the country's capacity to feed its people through effective production, storage, and trade programs. We analyzed both government and farm storage projects. We also made site visits to the projects and discussed the country's long-term storage needs with officials of the AID mission, the host government, and other donors.

In the Philippines, we reviewed the AID $12-million Integrated Agricultural Production and Marketing Project and AID participation in the multidonor Southeast Asia Cooperative Post-Harvest Research and Development Program. The Philippines post-harvest problems have occurred as production substantially increased. The country has now attained basic self-sufficiency in rice, but is still looking to solve its distribution and marketing problems and related factors contributing to continued poverty in the agricultural sector. We made site visits to the projects and discussed the country's post-harvest situation with officials of the AID mission, the host government, and other donors.

Through discussions and review of documents available in Washington, as well as a recent Kansas State University report on the project, we considered the reported results of the $6.2 million Grains and Perishables Marketing System project in Panama. This project originally envisioned major improvements in Panama's post-harvest food system and reductions in grain and perishables losses. Program objectives in Panama included constructing storage and dock facilities, purchasing transportation equipment and related activities to provide producers greater access to markets, ensuring consumers fair prices, and reducing food deterioration and spoilage.

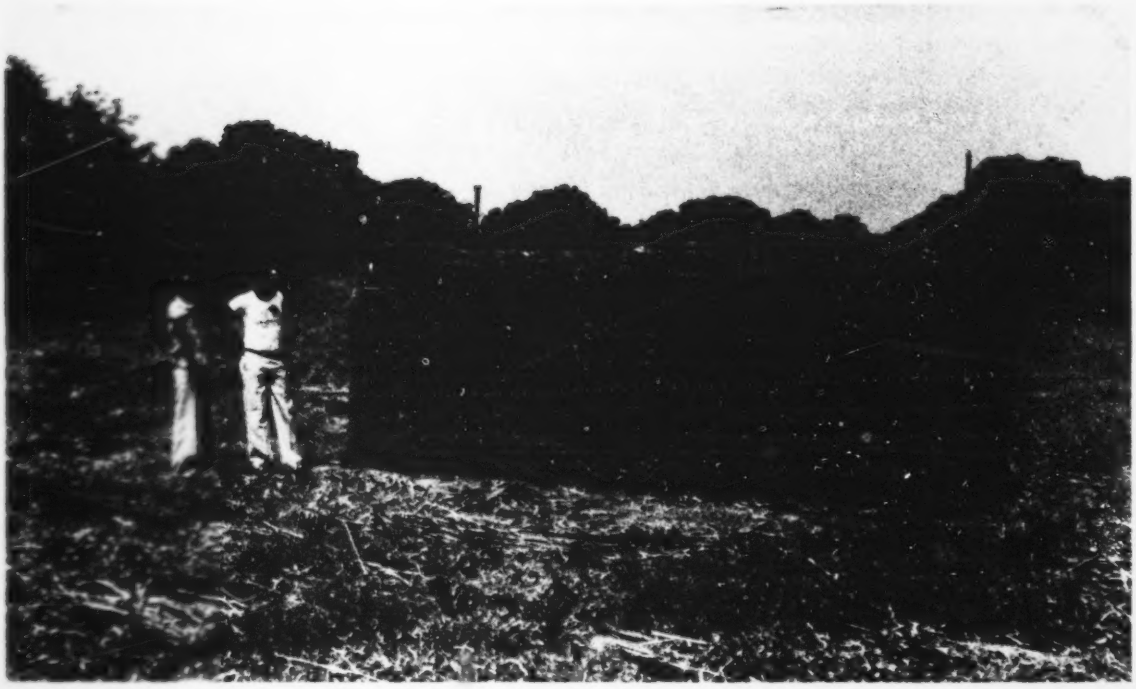
We attended the July 1981 Consultative Meeting on Post-Harvest Losses in the Caribbean which included representatives from FAO, the World Bank, AID, Kansas State University, the University of Idaho, numerous other bilateral and regional organizations, and most Caribbean countries. This meeting provided an added dimension to our other overseas work and had special significance in view of the 1980 Presidential Commission Report on Agricultural Development in Central America and the Caribbean which concluded that post-harvest losses are one of the most serious economic problems in the Caribbean Basin.

We visited Kansas State University, which for many years has provided technical assistance primarily on cereal grain storage problems; the University of Idaho, which recently established the AID-funded Post Harvest Institute for Perishables; and the Denver Wildlife Research Center, which was involved in a pre-harvest pest-control project in the Philippines and is now considering a project to study pest control in the post-harvest system.

We obtained AID's oral comments on this report. The comments were provided by officials of the Bureaus for Science and Technology, Program and Policy Coordination, and Africa. In their overall comments, Agency officials said there is general agreement that reduction of post-harvest food losses can increase the food available for growing numbers of malnourished people. Our report, they believed, will help focus AID's attention on the importance of the problem. Many important issues require resolution in terms of policy, guidance to missions, research and development strategy. AID's resolution of these issues will enhance its ability to improve the well being of the world's poor majority.

We also obtained the views of Kansas State University on this report. In their overall comments, university officials supported our recommendations. Their more detailed comments are incorporated, as appropriate, in Chapters 2 and 5.

BEST DOCUMENT AVAILABLE



UNTHRESHED MILLET STACKED IN A SENEGAL FIELD. OCTOBER 1981. (PHOTO BY GAO STAFF)

MILLET HARVESTED IN THE FIELD. OCTOBER 1981. (PHOTO BY GAO STAFF)

CHAPTER 2

FOOD CONSERVATION PROJECTS NEED BETTER MANAGEMENT

If AID's efforts to reduce post-harvest losses are expected to keep pace with the apparent severity of the problem, better management of projects must be an integral part of that effort. This chapter contains a brief synopsis of the projects we reviewed, highlights reasons why the projects were not more successful in reducing food losses, and makes project and country-specific recommendations. The remaining chapters contain our observations and recommendations on broader policy issues. By giving greater attention to these matters, AID can more successfully realize the potential for increasing food availability through food conservation.

SUBSTANTIAL PROGRESS HAS YET TO BE DEMONSTRATED IN REDUCING FOOD LOSSES

The projects we reviewed illustrate the complexities of post-harvest food-loss problems and the need for better-managed programs. Complexities involve limited AID-mission and host-country management and financial capabilities; difficulties in estimating the magnitude of food-loss problems and identifying where losses occur in the food chain; and--perhaps the most complex--helping small farmers (a basic tenet of agricultural assistance) participate in rural marketing systems. Little progress has been demonstrated in achieving project objectives of

--reducing grain storage losses in Senegal from 30 to 5 percent;

--reducing perishables losses in Panama by 50 percent and grain losses substantially;

--resolving post-harvest inefficiencies in the Philippines, by reducing by 10 percent those major crop losses which occur from producer to consumer; and

--benefiting small farmers in Senegal by operating government millet storage programs, building model grain storage facilities for farm use and establishing a revolving credit fund, as well as strengthening the position of small farmers in the Philippines by systematically addressing post-harvest problems arising from increased food production.

Senegal

Storage facilities costing $11 million, including $4.9 million in AID financing, have been used only sparingly to store grain. These 23 government-controlled grain storage facilities were part of an overall plan to (1) improve grain storage practices which, in the mid-1970s, contributed to substantial grain losses and (2) stimulate additional grain production through revised government pricing policies. Project planners believed that the warehouses would be full of domestically produced grain by 1980, thereby saving the government $2.5 million, annually, by reducing storage losses, and providing a buffer stock for times of food shortages.

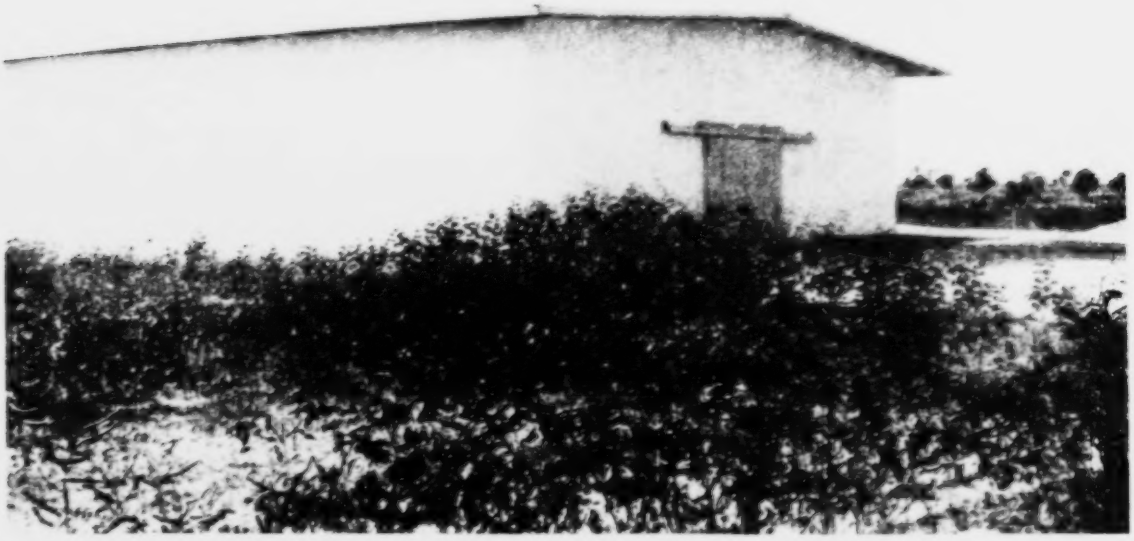
We visited AID-financed warehouses at seven locations; each facility was empty. Some warehouses had been used to store and distribute limited quantities of grain, but others were locked and had never been used. We were told that there have been at least six project managers, contributing to difficulties for any single person to monitor implementation problems. Because of this, we were only able to discuss a limited number of subjects with the current project manager.

According to the current project manager, grain had not been stored in the warehouses during 1981 because (1) the government's marketing board was dissolved due to mismanagement and corruption and (2) the government's financial resources are so limited that it cannot buy the quantities of grain planned in the project design. Discussions with Mission and Senegal officials raised serious questions about whether the government can effectively use the warehouses.

World Bank officials concurred with our observations on the need for improved government warehouse management. National program requirements need reassessment and improvements are needed in grain pricing and managing existing stocks according to these officials. They also believe that the (1) government grain pricing policy is inadequate to encourage private-sector participation in national storage programs and (2) improper management of existing government warehouses contributes to significant losses of food.

Current grain warehouse capacity exceeds the Senegal government purchasing and management capability, yet other donors are promoting the construction of additional storage facilities. Information developed in Senegal from government officials and bilateral donors indicated that

BEST DOCUMENT AVAILABLE



EXTERIOR OF EMPTY AID-FINANCED WAREHOUSE AT NIAKHENE, SENEGAL. OCTOBER 1981. (PHOTO BY GAO STAFF)

SIX WEST GERMAN WAREHOUSES AT THIES, SENEGAL. THESE 1000-TON FACILITIES WERE ALSO EMPTY. OCTOBER 1981. (PHOTO BY GAO STAFF)

--the government has warehouses to store about 75,000 tons of grain, but in 1981 it had the financial capability to purchase only about 30,000 tons of grain against its 70,000-ton target and

--West Germany and France were either in the process of building or were considering building additional facilities to store from 25,000 to 35,000 tons of grain.

In addition, FAO, as part of its 1979 Plan of Action on World Food Security, proposed the construction of warehouses in the Sahel to store 270,000 tons of grain, including 17,500 tons in Senegal. A 1980 FAO feasibility study for its proposed food security system concluded that the system would contribute to the role of national marketing boards in agricultural development, and it could reduce grain losses. A Senegal mission analysis of the FAO proposal raised the following points.

--A strong case can be made for the technical feasibility of an African food security zone; however, the Senegal experience of prior years illustrates some problems which would be faced in relying on national marketing boards.

--The Senegal Government tried to establish a buffer food stock, but encountered numerous problems. Farmers and consumers complained that pricing policies were unfair and numerous difficulties were encountered in establishing good storage management practices and in maintaining grain quality.

--Buffer stock operations in effect created a situation where the Senegal private market could not function well and the government continued to lose its credibility because of the State Marketing Board's poor management.

--The politics of food reserve creation and management must be recognized as being very difficult and something which donors have to more fully understand before decisions for action are made.

Various donors, as well as FAO officials, have criticized the FAO food security plan. AID officials believe the proposal is too grandiose and questioned how effectively the Sahelian countries would manage the system. Other donor agencies, such as the World Bank and the International Development Research Center, questioned the need for, and cost effectiveness of, additional central storage space in the Sahel. They also said that existing security storage systems have not been particularly effective in protecting stored grain. In fact, some officials suggested tht such storage facilities are so inefficiently operated that they constitute major sources of food losses there. Within the Senegalese government

agencies, we also found considerable opposition to government grain storage programs.

In Senegal, the sentiment was very strong among officials of the AID mission, the Senegal Government and the donor community, that storage programs should be directed at farms, villages, and cooperatives. A Senegal Government representative said that the major problem in Senegal's cooperative system continues to be inadequate storage--which forces many cooperatives to store grain in the open, subjecting it to insect infestation and spoilage from the region's excessive heat.

The $4.7-million Cereals Production I project included two post-harvest components: construction of model grain storage facilities and establishment of a revolving credit fund to financially assist small farmers. The storage silos initially designed for small farms proved to be too expensive and unsuitable for the climate. Subsequent storage bin designs were less expensive and technically adequate, but required mechanical threshers which were largely unavailable and too expensive for the farmers without a well-supported cooperative program. The revolving credit fund--crucial to small farmers in purchasing equipment, such as threshers and materials for building grain storage bins--was never established, primarily because of the government's financial problems and the dissolution of the national market board which was to operate the fund. The Cereals Production II project does not include post-harvest improvements envisioned in the initial project, due to the breakup of the national marketing agency.

RECOMMENDATIONS

We recommend that the Administrator, AID--in conjunction with the Senegal Government and other donors, as appropriate--assess Senegal's long-term storage requirements at government and farm levels. This assessment should consider the

- --feasibility of improving Senegal's capability to manage its existing storage facilities, including those financed by AID--effective management may involve making them available to the private sector;

- --need for and practicality of additional national level facilities such as are now in process and being considered; and

- --practicality of the FAO food security proposal and its modification as appropriate.

We believe an assessment of the FAO proposal is especially needed in view of the limited use of the AID-financed storage facilities in Senegal, the limited capability of the state marketing agencies to manage such facilities, and the view that storage

capability is needed locally rather than nationally. Because the FAO proposal has implications for other countries in the Sahel, the assessment may raise questions regarding its practicality for other countries and may call for a broader assessment of the proposal and appropriate U.S. actions to help FAO modify the overall proposal.

The Philippines

The AID $12-million Integrated Agricultural Production and Marketing Project, was initiated to improve the productivity and income of small farmers. Reduction of post-harvest losses is an important component of the project. Post-harvest problems known to seriously offset the productivity and income of small farmers include

--inadequate drying and storage capacity for year-round production,

--insufficient returns to small producers because they have to sell produce to avoid losses caused by bad weather and attacks by rodents, and

--phenomenal increases in rat populations in high crop-producing areas.

A 1981 AID evaluation concluded that insufficient attention had been devoted to solving these post-harvest problems which provided the basic framework for project approval.

Indicators of project success were to have included

--reducing food losses from harvest to consumption from an estimated 20 percent in 1976 to 10 percent in 1981;

--making grain storage and processing facilities available to small farmers at reasonable costs; and

--developing technological packages for production, processing, storage, domestic marketing or crop export which could maximize small farmer earnings.

The first indicator would have been impossible to demonstrate without a proven method to measure losses. The second indicator was a worthy goal, but requires much more attention. Progress is being made toward the third goal, but AID evaluations indicate that the project has concentrated too much on export crops which smaller farmers have trouble marketing.

AID assessments show that implementing the overall project has been difficult due to basic complexities in coordinating efforts of the AID mission, Kansas State University, numerous

host-government agencies, and Central Luzon State University. One AID official thought the project was too large to be managed effectively--believing that if it had been implemented as several projects, it might have been more successful.

One goal in the integrated production and marketing project included construction of a food and feed grain processing center at Central Luzon State University to (1) make the university self-sufficient in food, (2) gain marketing expertise by selling the supplies, and (3) assist farmers in the project area by purchasing more of their produce. The center represented the largest cost item in the loan component of the project ($1.4 million), yet years after project planning and implementation began, the capability to efficiently use the plant's capacity is being questioned. According to the 1981 AID evaluation, it is questionable whether adequate food is available for processing and, if so, whether markets for the processed food are readily available.

Because of questions concerning plant production capacity and whether adequate foods could be made available for processing, the evaluation suggested that available information be used to "lend a sense of realism" to the planned plant production. The study suggested that even with most optimistic estimates of farm production and the most encouraging links with farmers, needed produce was not expected to be processed through the plant. It was recommended that a comprehensive and rigorous feasibility study be conducted to answer questions about the plant. Many of these questions about organization, management, and funding have remained unanswered since at least 1979 and should have been thoroughly addressed in the initial project proposal.

During our work in the Philippines, we visited Central Luzon State University and discussed with officials of the mission the potential for efficiently using the plant's capacity. Mission officials believed that in time, the introduction of new processing technology to the region could sufficiently generate a market and serve its intended beneficiary--the small farmer. This belief, however, was not supported by documentation or analysis.

Kansas State University officials said that the center is designed to facilitate the research and training efforts of Central Luzon State University. It was noted that the center is situated uniquely in that it can potentially serve both rain-fed rice farmers and rice farmers relying on irrigation systems.

The overall objective of the project was to benefit small farmers. Even though the Philippines has achieved basic self-sufficiency in rice, post-harvest problems still exist. Technology to reduce losses is too expensive for smaller farmers and the government pricing policy does not encourage conservation.

AID and the International Rice Research Institute have developed improved rice threshing and drying equipment which can increase the net return on production by reducing losses and improving quality, but this equipment has proven to be too expensive for small farmers. Widespread use of this equipment on small farms requires either stronger farmer groups or cooperatives which can pool their resources. Mission officials noted, however, that cooperatives represent very few Philippine farmers. AID efforts to encourage cooperatives and, thus, strengthen participation of the rural poor in development were reviewed in our 1980 report. 1/ These efforts have not been uniformly successful because of many complex political, cultural, and economic factors.

During our review, we observed that an FAO processing and storage project for small farmers was designed to improve post-harvest technologies in rice threshing, drying, storage, and milling. The project is relatively small scale ($179,000) and involves three subproject area sites. Our visit to one project site revealed basic deficiencies in arrangements for small farmer credit. The combined income generated from storage fees and the milling revenue was expected to pay for initial investment costs, but because the farmers had used their land as collateral for a bank loan to finance a warehouse, they could not secure another loan to begin the milling process. The project coordinator was aware of these problems, but seemed to view them as an inherent difficulty associated in dealing with small farmers.

In our discussions with World Bank officials, they characterized the Philippines situation as being very complex, making it difficult to analyze and make policy decisions. Based on their experiences, however, the following factors should be considered.

--Significant losses of rice occur due to continuous inefficiencies in drying and processing.

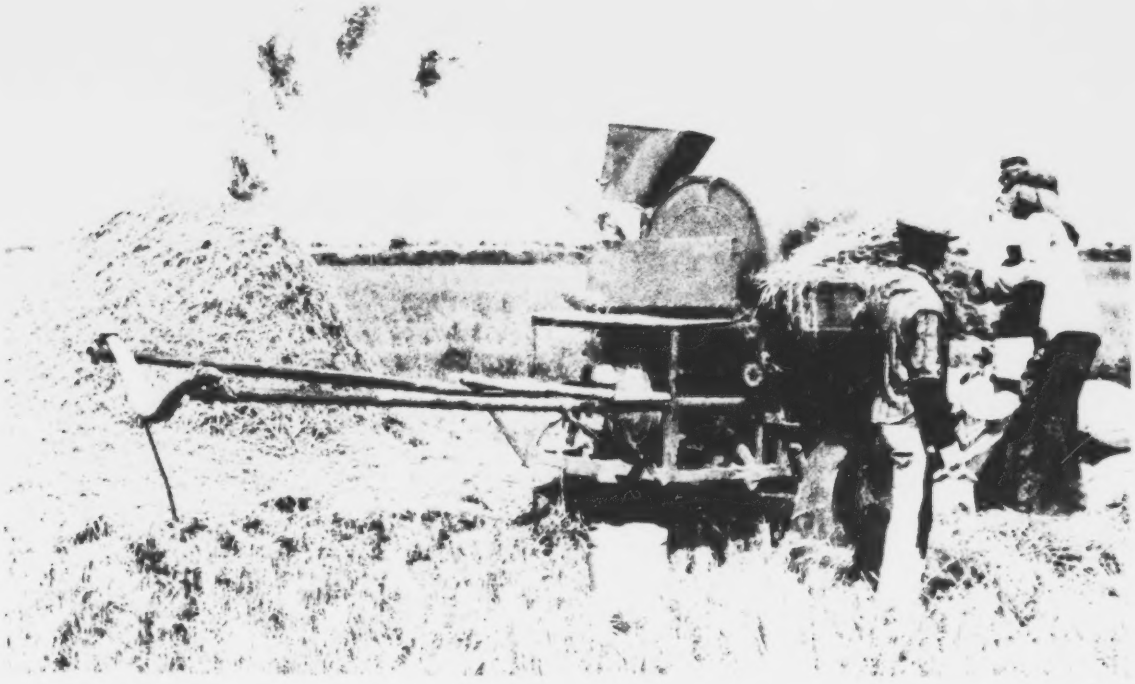
--The Government of Philippines is cautious in its approach to the issue of improving rice quality because such efforts could encourage developing a separate agricultural production zone for export--a situation not beneficial to small farmers.

--Food distribution to the poorest people in the most remote areas is a very important policy issue. National self-sufficiency is nearing reality, but many people do not have access to this supply and are malnourished. Government

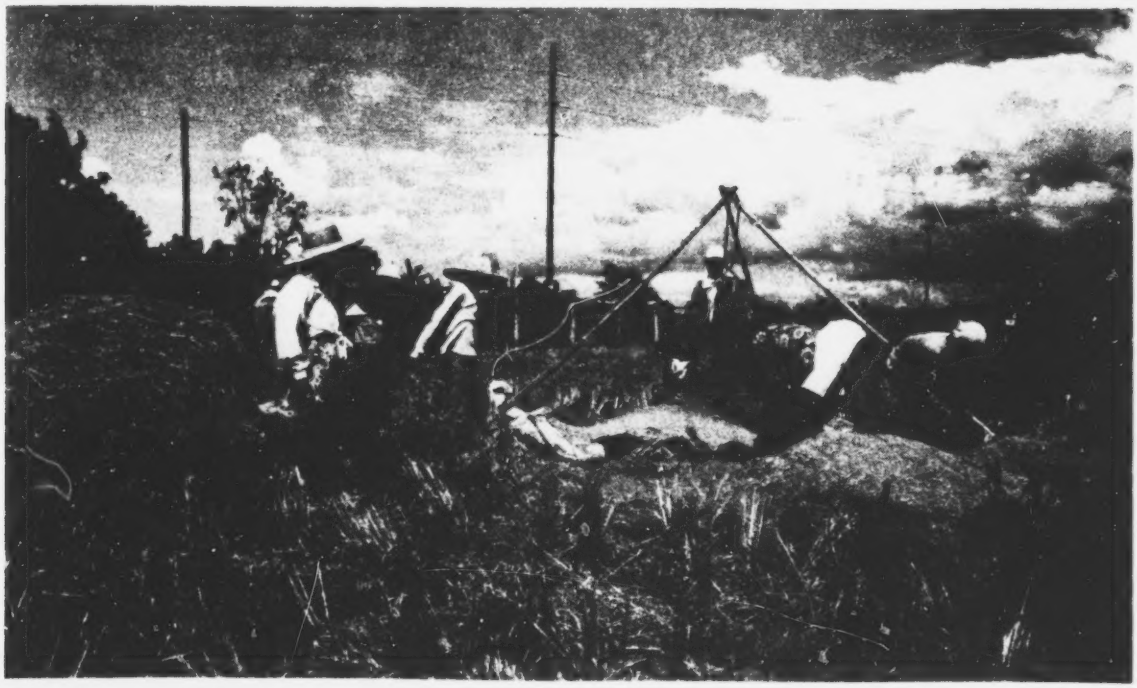
---

1/"AID Must Consider Social Factors in Establishing Cooperatives in Developing Countries," (ID-80-39, July 16, 1980.)

BEST DOCUMENT AVAILABLE



IRRI RICE THRESHER BEING USED IN THE FIELD, NUEVA ECIJA, PHILIPPINES. SEPTEMBER 1981. (PHOTO BY GAO STAFF)



THRESHED RICE BEING SIFTED BY HAND, LAGUNA PROVINCE, PHILIPPINES. SEPTEMBER 1981. (PHOTO BY GAO STAFF)

decisions regarding this problem will largely determine the Bank's future approach to agricultural and rural development assistance.

Most mission officials in the Philippines agreed that the recently established Government of Philippines National Post-Harvest Institute for Research and Extension could address country needs. This organization will address factors contributing to grain losses (currently estimated to range between 20 and 37 percent, annually) and the relationship between poor rice quality, pricing policy, and other long-term objectives. One of the key projects underway and funded by the World Bank aims to investigate the deterioration of harvested grains as they are moved from the field to drying areas. Rice in the domestic market traditionally contains foreign matter, such as weed seeds and stones, and an extremely high percentage of broken grain.

The Philippines mission believes farmers in the more remote regions who have no formal irrigation system and who must rely on rain for their source of water represent some of the poorest groups in the Philippines and that future assistance to them should follow a dual approach: diversified production and improved harvesting and post-harvest handling. The mission believes that technologies to reduce losses and improve the quality of rice are known; the challenge is to assure that technologies are affordable and suitable to farmer needs.

CONCLUSION AND RECOMMENDATION

Based on AID's experience in other projects and the limited success of the Philippines cooperative system, the challenge of improving the post-harvest position of small farmers in the more remote areas will not be easily met. To meet these post-harvest needs will require a well planned strategy and contributions from the mission, the Southeast Asia Cooperative Post-Harvest Research and Development Program and the Philippines National Post-Harvest Institute for Research and Extension. The challenge of assuring technologies are affordable and suitable to the farmer would also require considering the strength of cooperative systems, availability of credit, and, as discussed in Chapter 3, government pricing policies which affect the level of production and the quality of food for marketing.

The questions concerning the potential for efficiently using the food processing center at Central Luzon State University are still unresolved. We recommend that the Administrator, AID, in conjunction with the Philippines Government, develop and implement a plan for its efficient use.

Panama

Several country representatives to the July 1981 Caribbean Post-Harvest Conference believed that efforts to improve post-harvest systems should center on small farmers, but viewed this as a formidable task because of the wide economic and social gap between small farmers and established state agricultural systems. AID experience in attempting to help Panama implement a food marketing and loss-reduction project may illustrate how formidable the task really is.

The $9.5-million Grains and Perishables Marketing System project (which included $6.2 million in AID financing), has been the focus of an AID attempt to implement a successful project since 1975. A major project objective was to reduce by 1980, the loss of perishables in the phases between farmers and consumers by 50 percent. Most public grain facilities contributed to large losses and waste; the project goal was to reduce these losses substantially.

Project completion dates have been extended from December 1978 to June 1983 and have led to increased project costs ($9.5-10.5 million) and a revised project plan. The revised plan reduced grain storage construction to one-half the planned capacity and eliminated many needed improvements in handling and storing of perishables. The delays also resulted in continued extensive grain and perishables losses in Panama, estimated by Kansas State University to represent nearly $20 million as of 1980. According to AID evaluations and other documents, these factors contributed to project implementation problems.

--Delays in providing technical assistance to the state marketing agency affected the agency capability to plan its financial policy.

--Inadequate host-country capability to contract and administer construction, coupled with inadequate AID mission support, control, and monitoring.

--Failures to negotiate construction contracts when bids exceeded available funding by as much as 65 percent.

We are not making any recommendations concerning the Panama project. However, we believe there are lessons to be learned from the management of the project along with those in the Philippines and Senegal. Systematic attention to these lessons learned, as well as the positive experiences expected from on-going documentation services and other planned efforts, can provide a better basis for attention to post-harvest problems.

AGENCY COMMENTS AND OUR EVALUATION

Agency officials generally agreed with the thrust of our recommendations relating to Senegal and the Philippines, and they acknowledged that they have reservations about the practicality of the FAO food security proposal for the Sahel. In view of the seriousness of the food problem in Senegal, we believe future mission agricultural sector assessments should address the food storage issues raised in our analysis. Special teams have been formed to assess the feasibility of efficiently using the food processing center in the Philippines.

In commenting on our report, Kansas State University officials agreed that serious questions remain unanswered regarding the potential for efficient use of the food processing center. University officials also noted that there are questions as to whether the center should be used as a teaching and research facility or be leased to a commercial company.

Kansas State University officials also expressed concern that our analysis of the post-harvest components of the integrated agricultural production and marketing project unfairly portrayed the entire project as being problem plagued and unsuccessful. They did not provide examples of project accomplishments, but we are aware that the 1981 AID evaluation referred to in this report identified positive aspects of the project, particularly in the areas of institution-building and technological development for small farmers. Our conclusions concerning the food processing center are, in our opinion, particularly relevant in view of its cost and potential application.

Officials in the Bureau for Science and Technology believed that our report should focus more on overall strategies which AID should pursue and less on the results of the projects in Senegal, the Philippines and Panama. We agree with the importance of overall strategies and the following chapters are designed to help the Agency move forward in that direction. However, we also believe that evaluation of the lessons learned and results of individual projects, and strategy formulation are interdependent functions and equally important.

The projects in Senegal, the Philippines and Panama represented major dollar investments in relation to identified AID efforts to improve marketing systems and reduce food losses. The projects also represent examples of the management problems which can occur and the results should be viewed as part of the larger need to provide policy makers and planners with evaluative lessons learned and procedures for doing a better job in the post-harvest area. Because of these problems and the complexity of the post-harvest area, as further indicated in Chapter 4, we believe the Agency should conduct project impact evaluations to aid in its post-harvest strategy formulation.

CHAPTER 3

RECIPIENT-GOVERNMENT INSTITUTIONS AND PRICING POLICIES CONTRIBUTE TO LIMITED PROJECT SUCCESS

Weaknesses in government-controlled marketing institutions and in government-controlled prices severely affected some projects we reviewed. In particular, these factors contributed to minimal use of AID-financed facilities in Senegal and to delays and failure to achieve project objectives in Panama.

Our November 1975 report, 1/ discussed various governmental policies and institutional factors which hindered developing countries in growing as much food as possible. Problems exist even though foreign aid donors provide assistance to increase food availability. That report indicated a need for concerted actions by all donors to encourage recipients to remove production deterrents and to provide adequate incentives. This same need applies to the post-harvest sector.

LIMITED CAPABILITY OF GOVERNMENT-CONTROLLED MARKETING AGENCIES

> "The central problem in marketing and input supply is the very general tendency to give too large a set of responsibilities to public sector institutions, and too few to other agencies--individual traders, private companies, and farmers' cooperatives."--"Accelerated Development in Sub-Saharan Africa," The World Bank.

The difficult and complex tasks required for successful project implementation often exceed the financial and management capabilities of government marketing agencies, such as those responsible for implementing AID projects in Senegal and Panama. A more realistic appraisal and acceptance of what developing-country agencies can accomplish is required. Greater emphasis on the private sector has been suggested as an alternative, but practical ways to do so in the economic and political environments of the developing countries have not been defined.

Senegal has traditionally preferred public grain marketing institutions as an alternative to private traders and has tried to give marketing boards a virtual monopoly on grain trading. Success in the AID grain storage project depended heavily on the

---

1/"Disincentives to Agricultural Production in Developing Countries," (ID-76-2, Nov. 26, 1975.)

questionable capability of the Senegal national marketing board which was initially selected to be in charge of purchasing, storing, managing, marketing, and distributing food grain. According to the project proposal:

> "All of these (AID) programs and projects aimed at increasing food grain production demonstrate the need for a capacity on the part of Senegal's grain marketing organization, ONCAD, to purchase, store, manage and market such food grains. In fact, the success of the entire effort is dependent on ONCAD's capability in this respect."

Yet, in the project proposal, it was also acknowledged that

> "* * *farmers in general are suspicious of ONCAD when it comes to grain. In addition, farmers often see ONCAD as a villain because of alleged corruption, inefficiency and its role as debt collector. Regardless of the justification for these preceptions, ONCAD * * * has the potential capacity to effectively manage the proposed expanded grain reserve program."

A project evaluation concluded that because of management weaknesses in the national marketing board, the mission should deobligate the remaining project funds. The mission disagreed with this recommendation in 1980 because it believed that a new government agency would be created to replace the then-existing marketing board.

The Government of Senegal dissolved the marketing board that same year because of corruption and mismanagement and transferred responsibilities for the grain storage program to another government agency. The government is still inhibited, however, by limited financial and management capabilities in carrying out its basic marketing role. As an example of Senegal's limited financial capabilities, the government hoped to buy 70,000 tons of millet in 1981 but only had the resources available for half that amount. Limited management capability is thought to be yet contributing to significant losses of food stored in government facilities.

Our review suggests that changing government policies may result in some shift away from the use of national storage facilities. Since the grain storage project began, Senegal has taken steps to decentralize the economy, reduce subsidies on agricultural products, and generally place more emphasis on the private-sector role in development. These steps are being taken as part of an overall plan for reform which Senegal adopted under pressure from the World Bank, the International Monetary Fund, and other major lenders, to reverse economic decline. The implications of such a trend suggest that food self-sufficiency programs

will have to give greater consideration to options for improving storage capabilities at the local and farm levels.

The Grains and Perishables Marketing System Project in Panama also relied heavily on the national marketing agency for project management. This included management responsibility to construct grains and perishables storage facilities, purchase equipment, and administer an agriculture marketing system. According to AID project evaluations, the marketing agency encountered management problems which caused numerous project delays and increased project costs. Equipment purchases and facilities construction were not being carried out according to the project schedule, and agency personnel were not sufficiently trained.

In most Caribbean countries, government agencies are extensively involved in marketing. Participants in the July 1981 Consultative Meeting on Post-Harvest Losses generally agreed that these marketing agencies have not been very effective or efficient. Several participants believed that assistance to the private sector might be an alternative to public-sector involvement; however, it was generally conceded that little is known about the practical options to promote private trade through the traditional assistance process.

For developing countries in general, a 1981 World Bank analysis suggests that (1) public-sector marketing agencies have performed poorly, especially in handling perishable commodities; (2) increasing the efficiency of state marketing agencies has proven to be extremely difficult, if not impossible; and (3) government intervention and subsidization of marketing costs, including storage, has reduced the role of private activity which is traditionally more efficient in distributing food.

AID is now pursuing a new policy that recognizes and encourages the opportunities for greater development assistance through the private sector. According to recent testimony, AID plans to be more active in assessing various problems which affect project success including host-country policies. AID officials believe that private-sector development could concentrate on specific aspects of agricultural development, such as processing and marketing. An example given was a $6-million loan in Central America to finance several agribusiness projects.

We believe the problems noted in this review concerning the limited performance of developing-country marketing institutions reflect a more widespread problem in host-government support of donor assistance. Previous GAO reviews of other AID development and technical assistance projects indicated delays and reduced impact because host governments failed to provide adequate project support. (See app. I.)

PRICING POLICIES PROVIDE INADEQUATE INCENTIVES

Our review suggests that government pricing policies affect the production and post-production (storage, distribution, and marketing) systems almost simultaneously in terms of hindering developing-country efforts to attain food self-sufficiency. In Senegal the government would like to stimulate production through pricing policies, but has been confronted by contradictory supply and demand factors. For example, greater demand for millet in urban areas is encouraged by low prices, yet higher prices are needed to stimulate rural production and encourage better conservation practices. We were also told that the Government has subsidized the consumer price of imported rice, including food assistance programs, and that this has been a deterrent to increased production and consumption of locally produced grain. Serious questions were raised as to whether Senegal had the financial capability to buy the grain targeted for purchase under its national grain program. World Bank officials believed that the government grain pricing policy is inadequate to encourage private-sector participation in the national storage program.

In the Panama project, government pricing policies were also expected to play a key role in setting production supports and subsidies. Because of the numerous construction and procurement delays in implementation, it is difficult to comment on the relationship between pricing policies and project objectives. A March 1981 audit of the project noted that long-term storage capacity was necessary for the government to stabilize market prices. The evaluation also noted that the state marketing agency had not fully implemented a grain cost accounting system--considered essential to plans for setting prices.

In the Philippines, pricing policy is being considered a factor in improving post-harvest sector performance, especially in improving food quality. Pricing policy is being addressed in a $300,000 study which is a component of $20 million in World Bank loans to improve storage and processing. The Southeast Asia Cooperative Post-Harvest Research and Development Program has also supported discussions among participating countries about the impact of price policies on losses and on adopting cost-reducing/quality-improving technologies. Both the regional program and FAO are addressing the benefits of improved rice grading systems on farms so that the rewards for better quality are equitably reverted back to the primary producers. The Government of the Philippines National Post-Harvest Institute for Research and Extension is also expected to consider pricing policies and post-harvest performance.

According to an AID evaluation of small-scale irrigation projects, one of the major difficulties for many farmers in the Philippines is their inability to sell their product at a price

that covers the cost of production, earns them a profit, or provides sufficient income to cover their debts. The governmental institution for buying and selling rice offers the highest fixed price in the country. Even though most farmers think this amount is too low, they are forced to sell their product at even lower prices to private traders because they are unable to meet the technical standards of the government. Palay (unhusked rice) must be 95 percent pure and have a moisture content of no more than 14 percent. In most parts of the Philippines, mechanical threshers and driers, which farmers cannot afford, are needed to meet these standards, which are geared to qualify rice for export or elite internal consumption. The standards are necessary for international marketing and competition, but limit the farmers' ability to raise their income.

The adverse effect of developing-country policies and institutions has received increased attention in recent years. AID and other donor agencies are acknowledging the need to deal with such impediments to increased food availability.

The World Bank report, "Accelerated Development in Sub-Saharan Africa," extensively discusses the deterrent effects of various government policies and the inherent problems in making reforms, yet it concluded that policy changes are needed. The report stated:

> "While there is not much disagreement with the general propositions that higher producer prices would stimulate production and sales, or that marketing systems should become more efficient, pushing beyond these propositions is not easy because the problems are complex and involve broad aspects of development strategy. For example, the appropriate level of producer prices, the relationship between prices of export crops and food crops, and between prices of individual crops in each category are all a function of a government's development goals and social policy objectives. Nonetheless policy changes are needed* * *." (GAO emphasis added.)

An IDB assessment of the Latin American food and agriculture situation similarly stated that the combination of physical, technological, and institutional barriers to more rapid agricultural development--production and post-production--require that more attention be given to national agriculture and development policies which provide adequate production incentives.

CONCLUSION

Developing-country policies and institutions often adversely affect efforts to improve post-harvest systems, both in terms of efforts to develop agricultural systems beyond subsistence level farming and in terms of "second generation" problems associated

with production increases. AID and other donor organizations appear to be giving more recognition to such constraints and acknowledge the need to deal with them.

This renewed emphasis is consistent with our 1975 recommendations that AID and other donors work to modify developing country policies and institutions which are deterrents to expanded farm output and to assist such countries in taking effective action to provide adequate incentives. 1/ We believe much more needs to be done in harmony with those recommendations, however, because of the continued existence of recipient-government policies and institutions which either impede or fail to provide adequate incentives for both production and conservation. And although AID and other donors are acknowledging the adverse impact of some developing-country policies, it is not clear how assistance programs will be formulated in the face of such policies or used in aiding countries to modify them.

1/"Disincentives to Agricultural Production in Developing Countries," (ID-76-2, Nov. 26, 1975.)

BEST DOCUMENT AVAILABLE

RICE BEING SUN DRIED ON PHILIPPINE ROAD SIDE NUEVA ECIJA PROVINCE. SEPTEMBER 1981. (PHOTO BY GAO STAFF)

CHAPTER 4

FOOD CONSERVATION EFFORTS CAN BE ENHANCED THROUGH AID POLICY AND MANAGEMENT CHANGES

•Development efforts are aimed too much at food production and too little at food conservation and distribution.
--Tropical Products Institute officials.

•Lack of effective market integration leads to increasing post-harvest losses and to decreasing production possibilities.
--IDB officials.

•Consideration should be given to focusing Agricultural, Rural Development and Nutrition activities to more specific purposes, such as reducing post-harvest waste.
--House Committee on Appropriations.

POLICIES SHOULD EMPHASIZE CONSERVATION TO COMPLEMENT FOOD PRODUCTION

The management difficulties identified in the AID projects we reviewed are not necessarily unique to the post-production sector. They represent many of the basic functions of project management in terms of

--planning projects based on sound economic analysis, valid assumptions of host-country support and knowledge of the types of technologies that are appropriate in given situations, and

--implementing and monitoring projects to assure that goals and objectives remain valid in relation to changing conditions.

Better project management in these areas can provide a sounder basis for helping developing countries deal with specific post-harvest problems.

We believe that the AID Administrator should address the recommendation we made in our 1976 report. 1/ Our recommendation stated

---

1/"Hungry Nations Need To Peduce Food Losses Caused By Storage, Spillage, And Spoilage," (ID-76-65, Nov. 1, 1976.)

" * * * that the Administrator, AID, emphasize better facilities, practices, and self-help measures for preserving and distributing the food (1) already being produced and (2) anticipated to be produced. Such considerations should be part of the programing documentation."

Implementing our recommendation through the overseas missions might have alleviated congressional concern about the low priority AID assigned post-harvest food losses which led to enacting section 317 of the International Security and Development Cooperation Act of 1980. If more funds are to be effectively used for post-harvest food-loss efforts, as encouraged by section 317, then increased emphasis on a complementary approach to agricutural assistance is needed as well as more specific criteria to design individual projects and assure the greatest impact.

One reason that food conservation has not been given a higher priority, is the traditional agricultural policy emphasis on increased food production. The missions use this policy as a guide in preparing country strategies which, in turn, are used in formulating specific projects.

In view of the increasing evidence that inefficient post-harvest systems are becoming a dominant problem, limiting the capability of many agricultural systems to distribute and market food at low costs, some AID officials now advocate a better balance among improved food productivity, conservation, and marketing. Other organizations share this view, encouraging agriculture development through better production, processing, marketing, distribution, and agribusiness development. It is believed that the most effective development can occur by improving the entire food system.

The cost issue

Perhaps the greatest obstacle to better food production and conservation is the AID policy requiring that food conservation efforts must demonstrate they would be more efficient than further production efforts. AID officials said that in 1976 we did not adequately consider the cost of reducing food losses relative to the cost of producing additional food. This concern was subsequently reflected in the 1978 AID agricultural policy statement.

The policy states that

"direct efforts to improve the efficiency of food distribution systems, including reducing post-harvest losses, may also be required in some situations, but the expected returns from additional expenditures for this purpose must be weighed carefully against the potential returns from additional expenditures for accelerating food production."

This policy appears to encourage competition between funding for production and for conservation and is interpreted this way by some officials. Because of the difficulties in documenting and comparing cost effectiveness of production and of conservation, this policy inhibits greater consideration of food-loss reduction projects.

We support a policy that encourages providing food in the most economical way, but we have not identified a practical way to make such a determination. Necessary information is scarce or nonexistent and agricultural systems and needs for assistance vary significantly by region, country, and even within countries. Other organizations question whether basing policy direction primarily on a cost-benefit basis is practical or in the best interests of the developing countries, as shown in the following observations.

--The National Academy of Sciences concluded in 1978 that substantial refinement of knowledge about economic cost-benefit factors in post-harvest loss reduction is needed. Meanwhile, plans for food conservation should be supported by knowledge of the effects of social and cultural change based on the introduction of new technologies. Concerning cost-effectiveness analysis, the Academy believed it can be a useful tool only if good information is available.

--World Bank officials have concluded that the criteria for measuring benefits in terms of reducing losses has varied substantially among its individual projects. One analysis of investment issues for improving food marketing systems concluded that alternate investment decisions are very difficult under conditions of poor data and distorted price structures in developing countries.

--The Southeast Asia Cooperative Post-Harvest Research and Development Program analysis of post-production grain systems in Thailand, Malaysia, the Philippines, Indonesia, and Singapore has indicated that the economic viability and social acceptability of technological improvements, such as small threshers, dryers and mills, may be impossible to document. Complicating factors include the sometimes conflicting donor objectives of increasing labor productivity through mechanization versus the need to increase manual employment and assure more equitable distribution of income.

We also noted that methods for measuring losses need to be substantially improved before cost-benefit analysis is a legitimate AID policy criteria. The grain loss assessment manual, prepared by AID in consultation with other organizations including FAO and the Tropical Products Institute, was a step toward developing a standard method for measuring grain losses. However, both

FAO and the Institute have experienced substantial difficulties in applying this methodology to actual grain-loss projects.

GUIDANCE SHOULD BE PROVIDED THE MISSIONS ON PLANNING, DESIGNING, AND EVALUATING FOOD-LOSS REDUCTION PROJECTS

Aside from the 1978 agricultural policy statement which essentially stresses storage programs as the basic technology for reducing losses, the missions have not been provided policy guidance to design and carry out post-harvest loss-reduction projects. Guidance to the missions should be directed toward a more systematic consideration of food production and post-harvest assistance requirements. This is important because of the limited attention given to post-harvest problems and the complexities of applying post-harvest technologies.

Guidance to the missions should include an updated definition of the type of programs, projects, and technologies AID considers important in directing its future post-harvest efforts, including a clarification of the type of technologies believed to be most suitable for assisting the small farmer. This would provide a better basis for overall mission planning and assist in designing specific projects which have goals more subject to verification of their impact.

We noted that FAO has established specific criteria in its program which states that projects should

--have a high priority in a country's food-loss reduction program,

--be given priority in the less-developed, most seriously affected, food-priority countries,

--be completed in 1 and 1/2 to 2 years,

--involve only simple designs and technologies,

--be capable of expansion to attract further investments, and

--include assessment measures.

The program coordinator believed it is too early to summarize the results of the program because of the limited number of completed projects. Based on the experience to date, however, he believes that (1) post-harvest loss reduction should be integrated with production-oriented programs in an overall development strategy, with the appropriate balance or emphasis determined on a country-by-country basis; (2) projects in the Sahel have been delayed by numerous problems with construction contracts; and (3) loss assessment has proven more difficult than first assumed,

and FAO is still searching for simple assessment techniques which are effective in the field.

The problem in determining losses and project effectiveness is critical to the FAO program, because the priorities for loss reduction or other agricultural development programs have not been established. The program coordinator cautioned that the loss-assessment problem may never be resolved satisfactorily through statistically valid measurements. However, he also believed that successful application of technologies can be demonstrated in terms of acceptance by the users, who generally base such decisions on a combination of economic and social benefits.

We believe AID should develop guidelines for its overseas missions in planning and carrying out post-harvest projects, drawing upon FAO experience and its own with Kansas State University. Based on their many years of working together, the cooperative agreement between AID and the University contains technical assistance guidelines which might be a useful model in preparing similar guidelines for the missions. This guidance might be the key to successful assistance projects in the long term and a sound basis for giving loss-reduction a higher priority as the Congress has encouraged. Activities might then be better focused to better help the small farmers.

We were told that no impact evaluations of post-harvest loss-reduction activities had been made. Both the House Appropriations and Foreign Affairs Committees have encouraged AID to expand its impact evaluations to improve their programs. Because of limited project success and inherent complexities in reducing food losses, we especially encourage such evaluations and believe they are essential to developing a policy and management plan to assist developing countries.

Realistic project goals needed

We noted in the projects we reviewed that the potential benefits were overstated. We also noted that there was no practical way to measure progress. This observation is common to projects included in other GAO reviews. AID programing should concentrate on well-designed projects which can be verified.

The goal of reducing storage losses in Senegal from 30 to 5 percent appears to be highly optimistic and, in the absence of necessary information, could not be verified. For the Senegal project, the project manager and a technician concurred that the extent of loss reduction would be very difficult to determine and they questioned the validity of the loss rates which were used as partial justification for the project.

Reducing food losses in the Philippines by 10 percent would have been difficult to demonstrate without a proven method to

measure the loss of grain from producers to consumers. In addition, the goals of the $1.4-million processing center were overstated in terms of economical use of the facility.

Several of our reports have commented on the overly optimistic goals of project designs and the practical difficulties in evaluating progress. Our October 1981 report, 1/ stated:

> "We identified projects at six missions which appear to have been poorly planned and designed, resulting in overly optimistic project benefits and project completion dates."

Our July 1980 report, 2/ expressed the following conclusions which would apply to the post-harvest loss-reduction projects we reviewed.

> "Efforts should be made to establish project goals which realistically can be achieved.
>
> * * * Exaggerating the number of beneficiaries (or other results) undermines the real costs and actions needed to help them and tends to overstate the reulsts that may be be obtained with the assistance."

RECOMMENDATIONS

As recommended in our 1976 report, AID should emphasize better facilities, practices, and self-help measures for preserving and distributing food. We recommend that the Administrator, AID, as an integral part of its agricultural assistance program,

- --change the Agency's agricultural assistance policy to recognize food production and food conservation as complementing rather than competing functions and articulate production policy in such a way as not to inhibit consideration of food conservation measures;
- --require the missions to address post-harvest problems in their development strategies or, if more appropriate, in their agricultural sector assessments; and
- --develop guidelines for the overseas missions to design loss-reduction projects and set goals which can be verified.

1/"AID and Universities Have Yet to Forge an Effective Partnership to Combat World Food Problems," (ID-82-3, Oct. 16, 1981.)

2/"AID Must Consider Social Factors in Establishing Cooperatives in Developing Countries," (ID-80-39, July 16, 1980.)

AGENCY COMMENTS AND OUR EVALUATION

AID officials agreed that the various AID bureaus and the missions need to cooperate more fully in terms of project guidance, design, and evaluation. It was agreed that specific guidance for the missions in designing loss-reduction projects may be needed because little attention has been given by AID management to the requirements for post-harvest assistance, and it is a complex area for designing and carrying out effective projects.

Officials in the Bureau for Science and Technology believed that the benefits of loss reduction will be easier to document and demonstrate based on the results of the planned project, "Farm Level Postharvest Grain Losses." This project envisions more accurate measurements of grain losses and identification of where they occur in the food chain. The project should be beneficial in improving the design of projects at the farm level.

We believe the Bureau should be cautious in focusing primary attention to validating loss-measurement methodologies. Loss measurement, at least in terms of generally reliable indicators of problem areas, is important. Other considerations include application of food-conservation technologies to satisfy a combination of economic, social, and cultural requirements. Bureau officials stressed the need to transfer existing technologies and adapt them to conditions in developing countries. This appears to be an appropriate emphasis for changes in agricultural policy and related guidance to the missions.

It was noted that AID is considering policy guidelines for post-harvest conservation programs. In the course of our review, we were aware that a preliminary policy outline had been prepared, but found little progress has been made beyond that stage. We believe agricultural policy should recognize food production and conservation as complementary functions. This is essential to giving post-harvest development greater attention and to providing a more systematic consideration of food production and post-production needs in developing countries.

CHAPTER 5

NEED FOR A COHERENT RESEARCH POLICY AND IMPROVED MANAGEMENT OF RESEARCH ACTIVITIES

Our review of AID research to improve post-harvest technologies disclosed the same kinds of problems highlighted in our February 3, 1982, letter. Some of the same problems, which also continue in post-harvest research, relate to a need to

--define, identify, and classify research;

--develop a research strategy;

--give greater attention to research relevance, quality, and use; and

--identify technologies or methods already available which can be used or readily adapted to developing-country needs.

Because research has not been identified and classified, AID does not know how much it spends on post-harvest research, and--in the absence of an effective research strategy or plan--it has not established the parameters for such research. Without this information, it is not apparent how AID can plan and give long-term direction to its post-harvest research.

AID's 1982 Congressional Presentation stated that major efforts to support the U.N. goal to reduce post-harvest food losses includes research at Kansas State University. However, AID does not know the extent to which post-harvest food-loss research is conducted.

The university and AID have had a cooperative relationship since 1967; the September 1980 cooperative agreement extends the partnership for 5 years at a potential cost of $5.6 million. The primary purpose of the agreement is to provide technical assistance and training. The agreement does not specify how much research is to be done. We noted that the project paper preparatory to the cooperative agreement provided that the university would submit an annual research plan for AID approval. The project officer said that the purpose of the plan was to help establish research priorities and to provide direct AID approval for research-related disbursements. However, the requirement for the annual plan was not included in the cooperative agreement, and the university has not prepared one.

It appears that preparation and approval of a plan, as anticipated in the project paper, should help to alleviate and resolve differences regarding planned activities. For example,

AID and university officials do not entirely agree on the extent to which research should focus on small farmers.

Because the university does not distinguish between technical assistance and research when accounting for fund use, identifying research activities is difficult. At our request, university officials identified some research projects partially financed under the agreement, and the AID project officer gave us his perceptions of the identified activities. His observations demonstrate the different perspectives of AID and university officials. Based on the limited project descriptions we provided, he said that if the university had submitted a research plan including the identified activities, he might have questioned the use of funds for some of them for reasons outlined below.

1. Milled Rice Losses in Simulated Bag Storage. This research might be more appropriately conducted in developing countries.

2. Feed Processing Plant Design and Analysis for Developing Countries. This project might not address post-harvest problems affecting food for human consumption.

3. Computerized System for Feasible Agribusiness Development. This project might not directly benefit the small farmer.

4. Food Grain Security. AID post-harvest objectives have not been defined in terms of food-security objectives.

Kansas State University officials said that these specific research activities were conducted for a variety of reasons, including the need to strengthen the capability of University staff, to meet the anticipated technical assistance requests of AID missions, and in the case of the fourth example, to satisfy the request of another AID bureau. The apparent lack of understanding between the AID programing bureau and the University, concerning the merits of such research activities under the Cooperative Agreement, further suggests the need for a research plan agreed to by both parties.

In late 1980, AID entered into a $2.2-million agreement with the University of Idaho for a 5-year program to reduce perishables losses. Although the agreement specifies that the University will do adaptive research (as in the Kansas agreement), it neither requires that the university submit a research plan to AID for approval nor specifies how much research is to be done.

In contrast to the emphasis given to small farmers in the Kansas State cooperative agreement and the apparent disagreement among some officials on the proper extent of that emphasis, the agreement with Idaho hardly mentions small farmers. If research through Kansas State and the University of Idaho is expected to be

an important part of AID efforts to reduce losses, as it has indicated, we believe that the cooperative agreements should be amended to provide for AID approval of an annual research plan that establishes funding priorities and parameters.

Regarding the need for and proper focus for research activities, many donors have suggested that primary emphasis should be given to using or adapting existing information and technologies. According to FAO, many countries believe that quite a lot of useful technology is already available and, with small improvements, can be useful. FAO states that introducing new and relatively sophisticated technology into a large number of countries would not be practical. FAO representatives in Senegal emphasize that most projects are either based upon known technologies or involve adaptive research to determine the most appropriate, available technologies.

Other donors in Senegal also consider research in new technologies to be less important than applying known technologies. The French Cooperative Mission position is that known technologies are available, but have yet to be introduced into villages and farms where the greatest needs exist. The Program Officer at the Canadian International Development Research Center, a major proponent of post-harvest research in Senegal, explained that their mission is to apply existing technologies when possible, considering available resources and circumstances of the country.

RECOMMENDATIONS

We recommend that the Administrator, AID,

--develop a post-harvest research strategy, including priorities and planned activities and an appropriate emphasis on identification and use, or adaptation, of existing technologies.

We further recommend that, within the university cooperative agreements, that the Administrator

--clearly establish the focus of AID-financed research,

--provide for an annual research plan for AID approval,

--establish the amount of research that may be done,

--require that research activities be clearly identified, and

--confirm that on-going research is in harmony with AID's desired policy focus.

AGENCY COMMENTS AND OUR EVALUATION

In general, AID officials believed that our report focused too strongly on the research area in relation to other post-harvest food conservation requirements. Although Agency officials believed that food conservation research is important, they believed that a more important need is to transfer existing technologies and adapt them to the conditions in developing countries as opposed to sponsoring greatly increased research efforts.

In this report, we have raised questions only concerning the management of post-harvest research activities--our views concerning funding levels are limited to the need for clearly identified research activities. AID's belief that an important need is to transfer or adapt existing technologies is in harmony with expressions of other donors regarding research focus. We are recommending that AID's research strategy appropriately emphasize the identification and use, or adaptation, of existing technologies.

In terms of the cooperative agreements with Kansas State University and the University of Idaho, AID officials aknowledged that an annual research plan in the agreements would improve control over the disbursements and use of agreement funds. It was also noted that cooperative agreements are being used more frequently with other organizations. We believe such agreements also should, where appropriate, include research plans for AID approval of disbursements.

Kansas State University officials supported our general recommendations concerning the need for a post-harvest research strategy and more specific guidance and criteria for university agreements. They believed that a research strategy would assist in identifying the AID funding needed to finance specific projects. They also noted that the Cooperative Agreement prior to 1980 and the present agreement have been primarily aimed at providing technical assistance and training in developing countries. Research has been used primarily to strengthen the technical capabilities of the university. It was estimated that 10 percent of current agreement funds are used for research.

Recent GAO Reports Commenting on Host-Government Project Support

--Our October 16, 1981, report, "AID and Universities have yet to Forge an Effective Partnership to Combat World Food Problems," identified inadequate host-country support in the Philippines and Lesotho, contributing to project delays and lack of impact.

--Our July 16, 1980, report, "AID Must Consider Social Factors in Establishing Cooperatives in Developing Countries," identified inadequate host-country support in Liberia, Paraguay, and the Philippines. In some instances, agencies organizing cooperatives and providing training did not have the essential personnel and transportation; host-country personnel had been unavailable to work with AID technicians; and in one instance, the government had not adequately intervened on behalf of the farmers.

--Our March 29, 1979, report, "U.S. Development Assistance to the Sahel--Progress and Problems," concluded that host-country governments had difficulty placing adequate attention on all external assistance efforts and in administering their own internal activities. This recipient-country problem, in turn, placed a heavier management load on AID missions and contributed to delivery delays of U.S. technology to the Sahel people.

(471978)